

Patent Claims:

1. Structure of optically effective diffraction security elements in documents, **characterized by the fact** that the optically effective security element is provided with target-oriented encoding of data consisting of a discontinuous metallization layer and/or partially metallic conductive layers and/o zones of metallic layers in different planes.
2. Structure according to claim 1, **characterized by the fact** that the form of the encoding resembles figures, in particular lines, grid-lines, bows and/o circles.
3. Structure according to claim 1, **characterized by the fact** that the form of the encoding resembles orderly or randomly arranged geometric figures, in particular lines, grid-lines, bow and/or circles.
4. Structure according to claim 1, **characterized by the fact** that a demetallized zone (3) in top elevation is of meandering form.
5. Structure according to claim 1, **characterized by the fact** that metallized strip-like zones (7) and demetallized strip-like zones (8) are arranged alternately, whereby in top elevation the strip-like zones are extending parallel or vertically relative to the document feed direction.
6. Structure according to claim 1, **characterized by the fact** that the distance between two zones of the same or dissimilar electrical conductivity corresponds to the shortest distance between two electrodes.
7. Structure according to claim 6, **characterized by the fact** that the distance between two zones of the same or dissimilar electrical

conductivity is at least .1 mm.

8. Structure according to one or more of the preceding claims,
characterized by the fact that the metallized zones (7) are interrupted
5 by one or more demetallized zones (9) extending vertically thereto.
9. Structure according to one or more of the preceding claims,
characterized by the fact that the optically effective diffraction
security element is an OVD (1).
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10. Structure according to one or more of the preceding claims,
characterized by the fact that the optically effective diffraction
security element is a hologram.
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11. Structure according to one or more of the preceding claims,
characterized by the fact that the optically effective diffraction
security element is a kinegram.
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12. Apparatus for examining documents provided with optically effective
diffraction elements with a metallic reflection layer as described in
claims 1 to 11, **characterized by a capacitively operating scanner** (4)
the width of which is larger than the largest width of a document,
consisting of a linear array of a plurality of electrodes disposed in side
by side relationship, an electronic energization circuit and an electronic
25 evaluation circuit for comparing the signal pattern of the document to
be examined against corresponding reference signal patterns.
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13. Apparatus according to claim 12, **characterized by the fact** that a
plurality of electrodes are disposed side by side and/or in several rows
whereby a receiving electrode (6) or a transmitting electrode (17)
extends parallel to a plurality of transmitting electrodes (5) disposed in
side by side relationship or a plurality of receiving electrodes (18)

disposed in side by side relationship, respectively.

14. Apparatus according to claim 12, **characterized by the fact** that the electronic energization circuit consists of a current source, a
5 multiplexer (10), an oscillator (11) for providing energy to the transmitting electrodes (5) and an oscillator (12) for energizing the multiplexer (10).
15. Apparatus according to claim 12, **characterized by the fact** that the
10 electronic evaluation circuit consists of a current source, an amplifier (13), a demodulator (14), a comparator (15), a micro-processor (16) provided with a memory as well as with filters for the suppression of extraneous and interference signals.
- 15 16. Apparatus according to one or more of claims 12 to 15, **characterized by the fact** that the smallest distance between electrodes is less than .5 mm.
17. Apparatus according to one or more of claims 12 to 16, **characterized**
20 **by the fact** that the distance between a transmitting electrode (5) and the receiving electrode (6) is at least .5 mm.
18. Apparatus according to one or more of claims 12 to 17, **characterized**
25 **by the fact** that the apparatus is arranged in fast-running document processing machines.
19. Apparatus according to one or more of claims 12 to 18, **characterized**
by the fact that the apparatus is arranged in manual devices.
- 30 20. Apparatus according to one or more of claims 12 to 19, **characterized by the fact** that the apparatus is arranged in document reading devices.

21. Apparatus according to one or more of claims 12 to 20, **characterized**
by the fact that the scanner is arranged across the entire width of the
document such that visually distinctly perceptible optically effective
diffraction security elements of the same electric properties on one and
the same document are compared by means of a micro-processor.

22. Apparatus according to one or more of claims 12 to 21, **characterized**
by the fact that the scanner is arranged across the entire width of the
document such that visually similarly perceptible optically effective
diffraction security elements on one and the same document are
compared by means of a micro-processor.